

THE PHLEPSIDS OF MEXICO AND CENTRAL AMERICA.* (HOMOPTERA CICADELLINÆ)

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Genus Phepsius Fieb.

This genus was erected by Fieber for a small number of European leaf hoppers with vermiculate brown or dark lines inscribed on the elytra and usually with similar markings throughout.

This group reaches its highest development in the temperate region of North America. Only a small number of species extend into the more tropical regions and most of these are found in the mountains of central and southern Mexico, while no species is known from Central or South American regions.

The vermiculate lines will serve to separate nearly all of the species of the group, while the remainder show such evident relationship that they are easily placed. A few have lost these vermiculations by reduction in number, while others have lost them by the gradual substitution of dots in their place.

The following subgenera are represented in the North American fauna:

KEY TO THE SUBGENERA OF PHLEPSIUS.

- a. Head distinctly narrower than the pronotum; the lateral margin of pronotum strongly carinate, long, nearly equaling the short diameter of the eye.
 - b. Head much narrower than pronotum, which is produced between the eyes; vertex and front long and narrow; large active species with long narrow elytra..... *Iowanus* nov.
 - bb. Head slightly narrower than pronotum which is regularly rounding in front; front broader above; shorter and stouter species..... *Texanus* nov.
- aa. Head conical, about equaling pronotum; lateral margin of pronotum almost obsolete, never more than one-fourth the short diameter of the eye; elytra usually with an angular pattern on inner part; outer margin pale, often with four definite spots..... *Dixianus* nov.
- aaa. Head as wide or wider than pronotum; lateral margin of pronotum carinate, one-third the short diameter of the eye or longer; elytra with pattern transverse or wanting.
 - b. Front margin of head not produced or foliaceous.
 - c. Vertex long and flat; front flat in profile, meeting vertex in acute angle; margin blunt..... *Zioninus* nov.
 - c. Vertex short; front sloping, convex, thin; margin rounding or acute, but not produced..... *Phlepsius* Fieb.
 - bb. Front margin of head produced, foliaceous..... *Paraphlepsius* Baker

* The writer was asked to undertake the *Jasidæ* of the *Biologia Centrali-Americana* in 1902. The material arrived in very poor shape, but the work was taken up and more than half completed in the course of the next three years, including the figuring of many species by Mrs. Ball. A change to executive work at that time reduced the time possible to give to this material and so the work was not completed at the date the editors set for the close of the *Homoptera* volume. The writer then decided to publish his studies of the groups from time to time, as opportunity offered, after which the material will be returned to the *Biologia* collection.

Subgenus Iowanus nov.

Resembling *Phlepsius* but with head much narrower than pronotum vertex narrow, disc flat, front long and narrow, but slightly widening above. Pronotum large, pushed forward between the eyes, the lateral margins long and strongly oblique. Elytra very long and narrow, over one-third their length beyond clavus; central apical cell long curved, narrow at base. Surface of elytra regularly inscribed with vermiculate lines.

Type of the subgenus *Phlepsius (Iowanus) handlirschi*, n. sp.

This subgenus is remarkably distinct in the narrow head, front, and extraordinarily long elytra. It will probably be given generic rank later. *Phlepsius majestus* Osborn and Ball, which occurs in the central and southern United States, also belongs to this group. This species, together with the three following, form a striking series of large, showy forms that at first sight are often mistaken for tawny members of the genus *Gypona*.

KEY TO THE SPECIES OF IOWANUS.

- a. Vertex flat, the light margin narrow.....1. *elongatus* n. sp.
- aa. Vertex convex, the light margin broad.
 - b. Tawny, length 8½ mm. or over.
 - c. Female segment with a broad, short notch without teeth.
 - 2. *hebraeus* n. sp.
 - cc. Female segment with a deep narrow median slit with marginal teeth.
 - 3. *handlirschi* n. sp.
 - bb. Grayish or cinereous; length 7.5 mm. or less; female segment with a triangular notch and prominent teeth.....4. *spatulatus* V. D.

***Phlepsius (Iowanus) elongatus* n. sp.** (Fig. 1a and b).

Resembling *majestus* but narrower with a longer, flatter vertex and a long acuminate female segment. Length of female, 10 mm. Vertex transversally depressed, nearly flat on anterior half, acutely angled with the long narrow front, one-third longer on middle than against eye, half wider than long. Pronotum much wider than vertex, the outer angles prominent. Elytra very long and narrow.

Color. Vertex pale testaceous; the anterior third black except for a narrow light margin and a median line; a spot against either eye near the base and an irregular band on middle brownish or fuscous. Front pale with fuscous arcs, the upper pair very distinct and margining the vertex, below they coalesce into an irregular spot on the disc. Pronotum pale, irregularly mottled with brown, three fairly definite fuscous spots on the anterior sub-margin behind each eye. Scutellum fulvous with six light points. Elytra pale, fulvous, uniformly inscribed with testaceous.

Genitalia. Female segment continuing full width as long as the penultimate, then tapering into a long, slender point extending almost to apex of pygofers.

Described from a single female from Amula Guerrero, Mex. (H. H. Smith). This is a strikingly distinct species in many characters and unique in the genus in the elongate female segment.

Phlepsius (*Iowanus*) hebraeus *n. sp.* (Fig. 2a and b).

Resembling *handlirschi* in general form and appearance, slightly smaller; color and marking similar but slightly paler. Length 8.5–9 mm.; width, 3 mm. Vertex transversely convex, one-fourth longer on middle than against eye, twice wider than long, the anterior margin bluntly rounding to front; front long and narrow, the margin straight to just before the apex. Pronotum broad, the outer angle sharp. Elytra long and narrow; the anteapical cells parallel margined, a number of extra cells on the costa opposite the anteapicals.

Color. Vertex and face marked as in *handlirschi* and *majestus*. Pronotum pale, irrorate with brown and with a few black spots along the anterior sub-margin. Elytra as in *handlirschi* but lacking the rufous cast and usually with a few definite light spots in the apical cells.

Genitalia. Female segment moderately long, posterior margin slightly concave with a small semi-circular median notch.

Described from eight females, one from Vienna Museum, labeled "Mexico, Coll. Sign. *Jassus hebraeus* Stal (*hebraeus* det. Sign)," and seven from Amula Guerrero Mex. (H. H. Smith).

Phlepsius (*Iowanus*) handlirschi *n. sp.* (Fig. 3b, c, and d).

Form and general appearance of *majestus* Osborn and Ball. Slightly smaller and with a narrower vertex. General color, fulvous brown. Vertex pale yellow with a broad band and two sub-apical spots black. Length 9–10 mm.; width 3–3.5 mm. Vertex and face as in *hebraeus*. Elytra slightly broader and less flaring, second and third apical cells long and curved.

Color. Vertex pale yellow, a transverse band behind the ocelli widening on the disc and interrupted in the middle, and a pair of spots in front of this, black; this band incloses a yellow dot against each eye. Face pale sordid yellow. Short brown arcs on front and a dark ocellate spot on clypeus. Pronotum pale, coarsely irrorate with fulvous brown, the anterior sub-margin with coarse ocellate dark spots. Elytra pale, rather sparsely inscribed with fulvous; three dark spots along the suture.

Genitalia. Female segment short, transverse; posterior margin, nearly straight, the median third produced on each side of a narrow median notch extending over half way to the base; angles next this notch acute. Male valve semi-circular, plates long, acutely triangular, the extreme tips rounding, three times as long as the valve.

Described from three females and one male from Omilteme and Xucumanatlan in Guerrero (H. H. Smith) and Ciudad Mex. (Forrer). One female from Vienna Museum, labeled "Mexico Coll. Sign. (*hebraeus* det. Sign.) (114)," which is slightly darker than the rest but does not differ otherwise.

***Phlepsius (Iowanus) spatulatus* V. D.** (Fig. 4b and c).

This is a smaller, paler, and less definitely marked species, occurring commonly from Colorado south to Central Mexico. Specimens are at hand from Mexicali, June; Ti-Juana, August (Ball); El Taste and Presidio Mex. (Forrer). The short teeth on the female segment separated by an acute notch will readily separate this species from any other.

Subgenus Texananus nov.

Resembling *Phlepsius* but with head narrower than the pronotum, front rather broad, convex, widening above the antennæ and approaching the eyes. Vertex bluntly conical, the margin to the front rounding. Pronotum large, broadly and evenly rounding in front; the lateral margin long, oblique, and definitely carinate. Elytra broader and shorter than in *Iowanus*, whole surface inscribed with vermiculate lines. Type of the subgenus *Phlepsius (Texananus) mexicanus* n. sp.

KEY TO THE SPECIES OF TEXANANUS.

- a. Sutural margin of elytra not definitely marked with light.
 - b. Elytra uniformly irrorate.
 - c. Length 7 mm., female segment excavated to base.....5. *eugeneus* n. sp.
 - cc. Shorter, female segment excavated half way to base.....6. *superbus* V. D.
 - bb. Elytra with irregular areas of dark and light.....7. *mexicanus* n. sp.
 - aa. Sutural margin of elytra definitely light marked.
 - b. Vertex, pronotum and scutellum each with a pair of black dots.
 - S. *excultus* Uhl.
 - bb. Without definite black dots.
 - c. Vertex dark brown, nearly flat.....9. *hosanus* n. sp.
 - cc. Vertex cinereous, convex; species small.....10. *ovatus* V. D.

***Phlepsius (Texananus) eugeneus* n. sp.** (Fig. 5b and c).

Nearly of the form of *excultus* but larger, paler, and lacking the definite markings of that species. Pale grayish or slightly fulvous brown. Length 7 mm., width 3 mm. Vertex convex, one-fourth longer on middle than against eye, twice wider than long. Anterior margin bluntly rounding except at apex, front broader than in *hebraeus*, almost parallel margined until just before the apex. Pronotum but little wider than across eyes. Elytra longer than in *excultus*, flaring behind, the inner antepical cell very long, the outer one broadest in front.

Color. Pale yellow, two pairs of approximate dots on suture between vertex and pronotum as in *excultus*, two indistinct brown spots at apex of vertex, and front brown with pale dots. Elytra milky, inscribed with brown, faintly washed with rufous in most specimens, the tips of the claval nervures fuscous.

Genitalia. Female segment long, angularly narrowing posteriorly, middle half roundly emarginate clear to the base where there is a slight median tooth. Male valve very short and obtuse; plates large, triangular, with nearly straight margins, white with black spots at the base of the short marginal hairs; the stout spines of the pygofer exceeding those of the plates.

Described from twelve specimens from Acuguizotla, Guerrero, 3,500 ft. Oct. (H. H. Smith); Amula, Guerrero, 6,000 ft. Sept. (H. H. Smith); Das Arroyos, Guerrero, 1,000 ft. Sept. (H. H. Smith); Tierra, Colorado, Guerrero, 2,000 ft. Oct. (H. H. Smith); Cuernavaca, May; and Iguala, Mex.

This species may be separated from *excultus* by the absence of definite fulvous and wavy markings along the dorsum, as well as by the much longer notch in the female segment, and from *spatulatus* which it resembles by the distinct genitalia.

Phlepsius (*Texananus*) *superbus* V. D. (Fig. 6b and c).

This compact, dark brown species much resembles *mexicanus* but is slightly smaller and more elongate. The very dark face and distinct genitalia will readily distinguish it.

It occurs from Colorado and Oregon south to Central Mexico. Specimens are at hand from Ti. Juana, June (Ball) and Mescala, Guerrero Mex. (H. H. Smith).

Phlepsius (*Texananus*) *mexicanus* n. sp. (Fig. 7a, b, c, d and e).

Closely resembling *P. arcolatus* but quite distinct in shape of vertex and genitalia. A stout species with the brownish fuscous irrorations irregularly distributed, leaving patches of milk white. Length 6.75 mm., width 3 mm.

Vertex convex, with the front almost conical, nearly half longer on middle than against eye, almost three times wider than long, front broad wedge-shaped but little longer than its basal width. Elytra broad and short, the apices appressed; apical cells short.

Color. Vertex testaceous brown, three irregular blotches on the anterior margin and numerous dots on the disc pale; pronotum testaceous brown, with irregular hieroglyphic light markings on anterior half and light pustulate spots on the remainder. Scutellum with the apex and two marginal spots light. Elytra milky white, the nervures fuscous brown, the vermiculation mostly coalesced into fuscous dots which are larger toward the margins.

Genitalia. Female segment reduced, less than two-thirds as wide as the penultimate, consisting of an obtusely triangular plate with the apex produced into a strap-like tooth as long as the segment. A pair of broad plates arising under this segment cover the base of the pygofers and a pair of heavy folds occupy the corners. Male valve rounding, plates narrow, scarcely as wide as the valve, concavely narrowing to the blunt points, two and one-half times as long as the valve, not quite as long as the compressed pygofers.

Described from seven specimens from Orizaba, December (H. S. and F. D. G.); Chilpancingo, Mex., June, (H. H. S.); and one female from Vienna Museum labeled *mexicana* det. Sign.

Phlepsius (*Texananus*) **excultus** Uhl. (Fig. 8a, b and c).

This strikingly marked species resembles *eugeneus* in structure and *decorus* in markings but the fulvous dorsum and commisural line will at once distinguish it. It ranges through the southern United States and a single specimen is at hand from Puentad, Ixtla, Mexico, July (C. C. Deam).

Phlepsius (*Texananus*) **hosanus** *n. sp.* (Fig. 9a and b).

Form and general appearance of *decorus* O. & B. slightly smaller and with a definite concave light line between the ocelli. Length 6 mm., width $2\frac{1}{2}$ mm.

Vertex transversely convex, slightly sloping to the narrow margin, one-fifth longer on middle than against eye, twice wider than long. Front moderately broad above, wedge shaped, distinctly longer than wide. Pronotum but little wider than across the eyes. Elytra longer and more flaring than in *decorus*.

Color. Vertex brownish fuscous; a spot at apex, the line between ocelli and the base ivory white. Pronotum with tawny markings on the anterior third. Scutellum tawny with light and black spots. Elytra ivory white, with fuscous irrorations coalescing into irregular spots omitting the inner margin back to apex of clavus. This ivory margin is narrow next the scutellum and is crossed by the inner claval nervure. It widens out on middle of clavus and again before apex and usually bears one or more black spots in each expansion.

Genitalia. Female segment short, posterior margin nearly truncate with four triangular teeth on the middle third, the outer pair the larger.

Described from two females, from Orizaba, Dec., (H. S. and F. D. G.); and Tepetlapa Guerrero, Mex., Oct. (H. H. S.). The broad, stout form and the dark color within the median ivory spots render this an easily recognized form.

Phlepsius (*Texananus*) **ovatus** V. D. (Fig. 10a, b and c).

This is the smallest species of the group in Mexico and its small size, oval shape, and pale commissural line will at once distinguish it.

It ranges from Oregon and Colorado south to southern Mexico. Specimens are at hand from Cuernavaca, Morelos (H. H. S.); Jalapa, Vera Cruz, June; Aumlema, 535 ft., (Barrett); and Ti Juana, August, (Ball).

Subgenus Dixianus nov.

Resembling *Phlepsius* but with the head about equaling the pronotum in width; the lateral margin of pronotum very short, sub-obsolete, scarcely carinate; vertex flat or sub-conical, rather narrow, the width of head made up by the long diameter of eye which is nearly as great as the width of vertex; front long, convex margin, forming a regular curve to ocelli which are large and touch the eye; eyes wider than genæ; clypeus long, narrow, and very slightly constricted. Elytra long and narrow, venation obscured by the pattern, the central apical cell long and narrow, slightly curved, the outer anteapical broad at base, often acuminate with several supernumerary cells at apex, the costal margin often broadly light with four black spots; usually an angulate euttetix-like pattern on the disc.

Type of the subgenus *Phlepsius* (*Texananus*) *utahnus* Ball.

This is a very distinct little group, intermediate in character, between *Euttetix* and *Phlepsius* proper, and it will probably receive generic rank later. Its members can be recognized at once by the sub-obsolete lateral margin of the pronotum, the unusual width of the eyes, the costal spots, and the pattern of the elytra. *P. costomaculatus* is the most common Mexican form and has been figured but *utahnus* is more representative of the group, which includes a number of species from the southwestern United States, such as *pulchripennis* Bak., *loculatus* Ball, *stellaris* Ball, and *floridanus* Ball.

KEY TO THE SPECIES OF DIXIANUS.

- a. Vertex short, convex, almost parallel margined; elytra pale, costal spots large.....*costomaculatus* V. D.
 aa. Vertex definitely angulate, flat; elytra with a heavy pattern and small costal spots.....*utahnus* Ball

Phlepsius (*Dixianus*) **costomaculatus** V. D. (Fig. 11a, b, c, d and e).

This pale species is the largest one of the group. It occurs in most of the Gulf States region of the United States and is the only one so far known to occur far south of the Mexican border. Specimens are at hand from Teapa in Tabasco, Mexico, February, (H. H. S.).

Phlepsius (*Dixianus*) **utahnus** Ball.

Of this beautiful little species which occurs in the southwestern United States a single example has been examined from Comondu, Lower California, Mexico (Haines).

Subgenus Zioninus nov.

Resembling *Paraphlepsius* in general form but without the foliaceous margin to the vertex. Vertex long, flat, rounding or subangulate in front; face almost straight in profile, meeting vertex at an acute angle; the margin blunt and not inclined to be foliaceous; front broad, wedge-shaped, the ocelli distant more than their width from eyes. Pronotum with the lateral margin almost as long as the short diameter of the eye, strongly carinate. Elytra broad, short, apical cells almost quadrangular, venation of disc much obscured by heavy reticulations.

Type of the subgenus *Phlepsius* (*Zioninus*) **extremus** Ball.

The broad, short form of this small species renders it quite distinct in the broad-headed groups, while the large, flat vertex and reticulate venation set it off structurally from all others.

Phlepsius (*Zioninus*) **extremus** Ball (Fig. 13a, b, c, d and e).

This species has been found in the United States from Utah to California and south to Mexico. Mexican examples are at hand from Ti Juana, June and August, (Ball).

EXPLANATION OF PLATES.

PLATE XXXIII.

- Fig. 1. **Phlepsius* (*Iowanus*) *elongatus* n. sp.
Fig. 2. *Phlepsius* (*Iowanus*) *hebraeus* n. sp.
Fig. 3. *Phlepsius* (*Iowanus*) *handlirschi* n. sp.
Fig. 4. *Phlepsius* (*Iowanus*) *spatulatus* V. D.
Fig. 5. *Phlepsius* (*Texananus*) *eugeneus* n. sp.
Fig. 6. *Phlepsius* (*Texananus*) *superbus* V. D.
Fig. 7. *Phlepsius* (*Texananus*) *mexicanus* n. sp.

PLATE XXXIV.

- Fig. 8. *Phlepsius* (*Texananus*) *excultus* Uhl.
Fig. 9. *Phlepsius* (*Texananus*) *hosanus* n. sp.
Fig. 10. *Phlepsius* (*Texananus*) *ovatus* V. D.
Fig. 11. *Phlepsius* (*Dixianus*) *costomaculatus* V. D.
Fig. 13. *Phlepsius* (*Zioninus*) *extremus* Ball.

* In all figures *a* refers to adult; *b*, ♀ genitalia; *c*, ♂ genitalia; *d*, elytra; *e*, face.